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A new species of mealybug (Insecta: Homoptera: Pseudococcidae) from Western Australia

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Abstract

The adult female and the first instar nymph of *Eucalyptococcus hakeae* sp. nov. are described and illustrated. The genus *Eucalyptococcus* is redefined and a key to the species is provided.

Introduction

A new species of large mealybug (Homoptera: Pseudococcidae) was collected by Dr T.F. Houston in 1979 from the stems of *Hakea* sp. (Proteaceae) in Western Australia. The adult female of this species is similar to those of *Eucalyptococcus* Williams and *Laminicoccus* Williams and most species of *Dysmicoccus* Ferris in having oral collar tubular ducts and 17 pairs of cerarii. The new species is here placed in *Eucalyptococcus* because of the nature of the cerarian setae, the type of oral collar duct and the large body size of the adult female. The inclusion of the new species necessitates a redefinition of the genus *Eucalyptococcus*, which is provided here together with a comparison of the closely related genera *Dysmicoccus* and *Laminicoccus* and a key to the species of *Eucalyptococcus*. The adult female and the first instar nymph of *Eucalyptococcus hakeae* sp. nov. are described and illustrated.

Methods

The preservation, slide-mounting, mensural and illustrative methods employed were those of Gullan (1984). The morphological terminology of Williams (1985) was used for the descriptions. Structural variation was recorded as the range. Body segments are referred to by Roman numerals, e.g. abdominal segments I-VII. Each figure represents a generalised individual based on all of the specimens specified in the description.

All the specimens are deposited in the Western Australian Museum (WAM), Perth.

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Systematics

Genus *Eucalyptococcus* Williams, 1985

Redefinition (emendations to Williams' [1985] description shown by an asterisk)

Adult female: Body broadly oval, usually large, at least 6 mm long and often as long as 9 mm. Cerarii numbering 17 pairs, all on sclerotised areas. Anal lobe and penultimate cerarii usually* (not always) larger than anal ring. Anal lobe cerarii with 2 or more conical setae. Anterior cerarii with varying numbers of conical setae but always more than 2, sometimes, with as many as 20. Auxiliary setae present or absent*. Dorsal setae short and slender, always shorter than cerarian setae except on posterior abdominal segments; often on prominent setal bases. Ventral oral collar ducts present, each with an inner flange-shaped collar. Dorsal tubular ducts absent except for a few near posterior cerarii. Anal ring with 2 rows of pores and 6 setae, mostly* about twice as long as diameter of anal ring. Trilocular pores abundant. Circulus well developed or absent*. Legs well developed; claw without denticle. Antennae 8-segmented.

At present, the distinction between *Eucalyptococcus, Dysmicoccus* and *Laminicoccus* is obscure and they cannot be separated on any single character. Instead a combination of characters is required. The adult female of *Eucalyptococcus* differs from *Dysmicoccus* in the following characters: (i) the penultimate and anal lobe cerarii are much larger in area than the anal ring except in *E. hakeae* which has, however, 15-25 conical setae in the penultimate and anal lobe cerarii in contrast to 2 conical setae in *Dysmicoccus,* (ii) some or all anterior cerarii always with more than 6 conical setae, sometimes as many as 20 (2-6, rarely more in *Dysmicoccus*), and (iii) oral collar ducts with an inner flange-shaped collar (flange absent in *Dysmicoccus*).

Eucalyptoccus differs from *Laminicoccus* in: (i) the large body size, (ii) having the dorsal setae mainly shorter than the conical cerarian setae, (iii) having all the cerarii on a sclerotised area, and (iv) possessing auxiliary setae except in *E. hakeae* in which, however, the anal lobe cerarii are almost the same size as the anal ring and the penultimate cerarii are smaller than the anal ring. In *Laminicoccus,* the penultimate and anal lobe cerarii are usually larger than the anal ring.

Because species of *Eucalyptococcus, Dysmicoccus* and *Laminicoccus* are closely related, study of the males and immatures of the species of these three genera will be necessary to help elucidate the phylogenetic relationships.

Key to species of ***Eucalyptococcus***

(amended from Williams 1985)

1 Anal lobe cerarii each with 2 conical setae 2

\- Anal lobe cerarii each with more than 2 conical setae 3

2 Penultimate cerarii each with 2 conical setae; anterior cerarii each with 3-7 conical setae . . . . . .*lobulatus* (Maskell)

- Penultimate cerarii each with about 8 conical setae of different sizes; anterior cerarii each with 7-11 conical setae, never with fewer than 7 .... *brookesae* Williams

3 Anal lobe and penultimate cerarii each much larger than anal ring and with auxiliary setae ..... *gisleni* (Ossiannilsson)

- Anal lobe cerarii almost same size as anal ring and penultimate cerarii noticeably smaller than anal ring, each without any auxiliary setae ..... *hakeae* sp. nov.

Eucalyptococcus hakeae sp. nov.

Figures 1-2

Holotype

WAM (86/221), adult ♀, on stems of *Hakea* sp. (Proteaceae), 2 km WNW of Woolbernup Hill, 34°01'S, 119°41'E, Western Australia, 29-30 November 1979, T.F. Houston 298-8.

Paratypes

WAM (86/222-225), 4 adult ♀♀ slide-mounted, same data as holotype.

Other material examined

WAM (86/226-228), 3 adult ♀♀ in alcohol: 12 first instar nymphs slide-mounted, ex WAM (86/221-228), same data as holotype.

Diagnosis

Adult females of *Eucalyptococcus hakeae* can be distinguished from those of other species of *Eucalyptococcus* by: the anal lobe cerarii being almost the same size as the anal ring, the penultimate cerarii being much smaller than the anal ring, and all the cerarii lacking auxiliary setae. Moreover, the host plant is *Hakea* instead of *Eucalyptus* (Myrtaceae).

Description

Adult female (based on 5 slide-mounted specimens, Figure 1)

Body broadly oval, 6.0-6.6 mm long, 4.5-4.9 mm wide. Anal lobes poorly developed, each with an apical seta about 170 μm long and an elongate angulate area of sclerotisation arising from sclerotisation around apex. Antennae slender, 8-segmented, 850-1040 μm long; apical segment 130-160 μm long with 18-28 setae 20-50 μm long. Eyes prominent, 30-45 μm in diameter. Clypeolabral shield 290-320 μm long. Labium 250-280 μm long. Legs well developed; hind trochanter + femur 756-825 μm long; hind tibia + tarsus 810-880 μm long, always longer than trochanter + femur; claw 40-55 μm long. Translucent pores numerous on entire hind femur, less on hind tibia. Circulus absent. Ostioles well developed, with inner edges of lips sclerotised. Anterior ostioles with 3-7 setae and 14-23 trilocular pores on anterior lip, 8-12 setae and 25-42 trilocular pores on posterior lip. Posterior ostioles with 12-18 setae and 38-50 trilocular pores on anterior lip, 8-10

setae and 30-45 trilocular pores on posterior lip. Anal ring oval or elongate oval, 200-240 μm long and 158-166 μm wide, with 6 setae 135-215 μm long and 2 rows of pores. Cerarii numbering 17 pairs, all on distinctive sclerotised areas, with conical setae and trilocular pores only. Anal lobe cerarii each on an almost rectangular area, 180-250 μm long and 138-213 μm wide, almost same size as anal ring, with 15-24 conical setae of different sizes (15-45 μm long) and 135-195 trilocular pores. Penultimate cerarii each on an almost circular area, 105-123 μm long and 110-150 μm wide, noticeably smaller than anal ring, with 18-25 conical setae of different sizes (13-35 μm long) and 85-99 trilocular pores. Anterior cerarii all almost circular, each 8-19 conical setae and 20-57 trilocular pores.

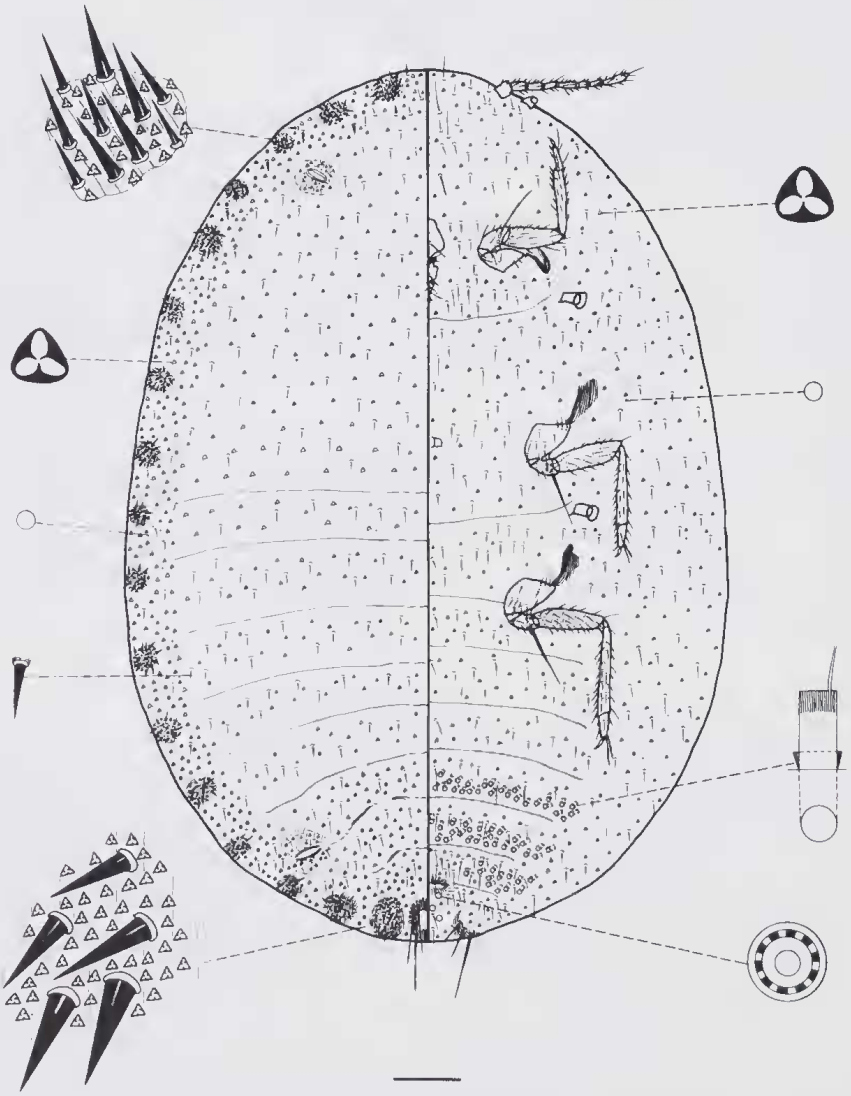

Figure 1 Adult female of *Eucalyptococcus hakeae* sp. nov. Scale line, 0.5 mm.

Dorsal surface with short pointed setae 10-23 μm long except on abdominal segments VIII-IX where some setae 38-40 μm long. Each seta with a short prominent base. Trilocular pores about 6 μm in diameter, evenly distributed but more numerous in band around body margin and on posterior abdominal segments. Discoidal pores about 2 μm in diameter, sparse. Oral collar tubular ducts absent.

Ventral surface with setae of different sizes: short pointed setae 13-25 μm long on entire ventral surface; long and slender setae 80-125 μm long mostly in median areas but towards head some may approach 160 μm long; cisanal setae 50-65 μm long. Trilocular pores same size as on dorsum, with fairly even distribution. Discoidal pores same size as on dorsum, sparse. Multilocular disc pores (1-6) behind vulva only, about 10 μm in diameter. Oral collar tubular ducts situated in rows across abdominal segments V-VII, each about same diameter as a trilocular pore and with collar flange-shaped.

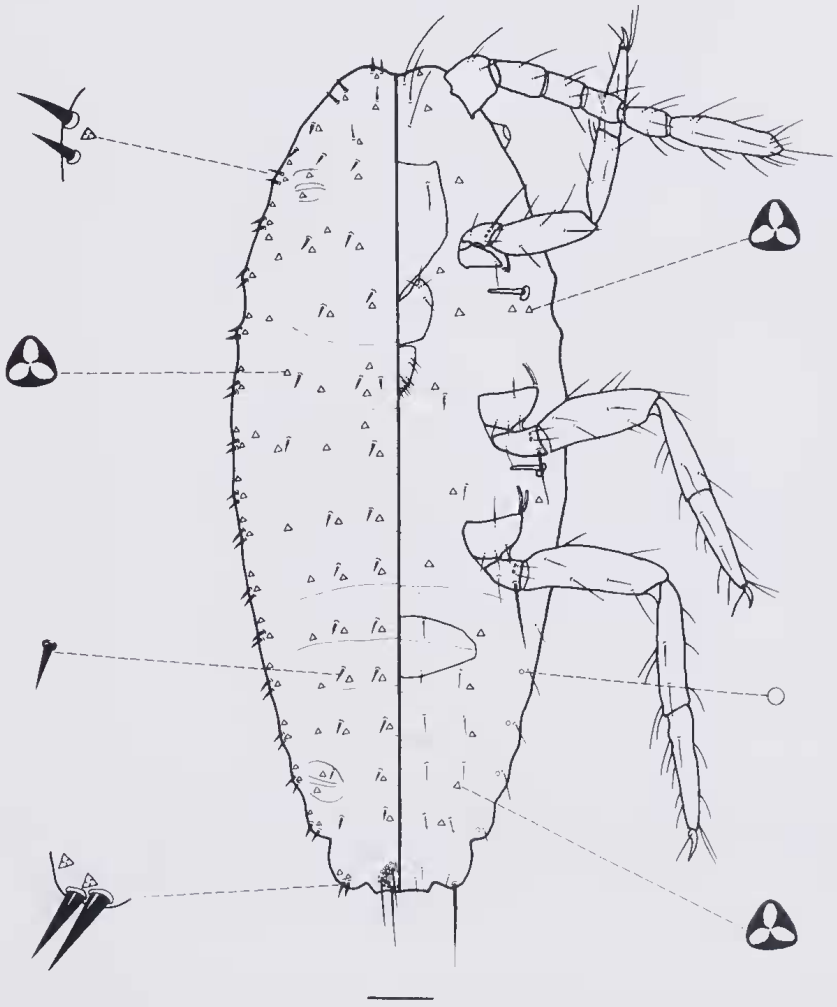

Figure 2 First instar nymph of *Eucalyptococcus hakeae* sp. nov. Scale line, 0.05 mm.

First instar nymph (based on 5 slide-mounted specimens, Figure 2)

Body elongate oval, sides subparallel, 0.59-0.62 mm long, 0.25-0.28 mm wide. Anal lobes well developed, each with an apical seta 75-100 μm long but no sclerotised area. Antennae 6-segmented, 250-280 μm long; apical segment 85-100 μm long with 19-24 setae 18-48 μm long. Eyes 18-20 μm in diameter. Clypeolabral shield 100-110 μm long. Labium 80-100 μm long. Legs well developed; hind trochanter + femur 138-159 μm long; hind tibia + tarsus 200-218 μm long, always longer than trochanter + femur; claw 23-28 μm long. Circulus very large, broadly oval, 47-60 μm long and 88-125 μm wide, divided by intersegmental line. Ostioles with inner edges of lips very slightly sclerotised, each lip with 0-1 setae and 1-3 (mostly 1) trilocular pores. Anal ring 43-45 μm in diameter, with 6 setae 63-95 μm long and 2 rows of pores. Cerarii numbering 17 pairs, all unsclerotised, each represented by a pair of conical setae 8-23 μm long with 1-2 (mostly 1) trilocular pores.

Dorsal surface with short setae 8-13 μm long. Four setae and 6 trilocular pores about 4 μm in diameter on each segment, longitudinally, forming 4 rows of setae and 6 rows of trilocular pores.

Ventral surface with setae longer than on dorsum, 13-33 μm long except a few 50-63 μm long on head. Six setae and 2 trilocular pores, same size as on dorsum, on each of abdominal segments III-VII; fewer setae and fewer trilocular pores on thoracic segments; 3 pairs of long setae and 4 trilocular pores on head. Discoidal pores about half size of trilocular pores, 1 on submarginal area of each side of abdominal segments IV-VII.

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